Standard Indicators
SCIENCE 3.2.3, 3.2.4

Mysterious Seeds

Purpose

Students will use technology tools to observe seed parts and keep an electronic notebook that describes observations of seed parts and how they grow. Students will present a digital slide show of their observations.

Materials

For the teachers: lima beans, copies of Black Line Master (BLM) *Science Journal*, chalk, chalkboard, 3 toothpicks, water, paper towels, 2 sealable plastic bags, stapler, tape

For the students: 3 or 4 hand lenses, 3 or 4 metric rulers, digital camera, computer, word processing and presentation software

Activity

A. Pre-Activity Preparation

1. Soak the lima beans in water for 10-24 hours.
2. Make a science journal for each student by photocopying eight copies of the BLM *Science Journal* and stapling them together.

B. Pre-Activity Discussion

1. Ask students what they already know about seeds and plants. Record all responses on the chalkboard.
2. Ask the students questions such as: "Where do plants come from? Have you ever watched a plant grow?"
3. Using a toothpick, pry open the halves of a lima bean.
4. Place the two seed halves so the insides are facing up; allow students to observe the parts of the seed.
5. Ask students: "What do you see? Does anyone know the names of these seed parts?"
6. Tell students the names of three seed parts:
   - *seed coat* (outer covering)
   - *cotyledon* (stored food that makes up most of the inner seed)
   - *embryo* (beginning of the plant)
7. Give students science journals and challenge them to write and draw clearly and accurately enough that someone else could learn by reading their journals.
8. Direct students to make drawings of the two seed halves on the first page. Have students draw arrows to the three parts of the seed and label the arrows.
9. Ask students: "Do you think a plant will grow from the seeds that have been separated in half? If so, do you think plants from seed halves will grow the same as plants from whole seeds?"
10. Have students take digital pictures of the two seeds halves. These pictures will be used later in their digital presentation.

Technology Literacy Standards

	I	II	III	IV	V	VI	VII
1						X	X
2				X		X	X
3				X			
4	X						
5				X			
6						X	
7							
8						X	
9						X	
10				X		X	
11							
12							
13							
14							
15							
16							

X = This Technology Literacy Standard is addressed in this lesson.

☐ = This Technology Literacy Standard is not addressed in this lesson.

C. Growing Plants

1. Explain to students that they will be observing the growth of seeds and seed halves and recording their observations.
2. Place a piece of wet paper towel in a plastic bag. Staple the bag about 2 cm from the bottom.
3. Pry open two bean seeds and separate the halves. Place all four seed halves in the bag with the inside of the seeds facing out. Label it “Bag #1.”
4. Prepare a second plastic bag like the first one. Place four whole bean seeds into the bag. Label it “Bag #2.”
5. Seal both bags and tape them to a wall that receives sunlight.
6. Have students draw the seeds on their first journal page.
7. Have students take digital pictures of the seeds. These pictures will be used later in their digital presentation.

D. Observing the Plants

1. Every three or four days, have students use a hand lens to examine the whole seeds and the seed halves.
2. Remove one of the whole seeds from the bag. Separate the halves and allow students to observe the inside of the seed.
3. Instruct students to make drawings on a new page of their science journals and record all of their observations. Also have students take digital pictures of their observations.
4. Once the beans have begun to grow, have students use a metric ruler to measure the growth of the plant in millimeters and record the length in their science journals.
5. Have students continue to track the growth of the seeds. Students should see the greatest embryo growth in the whole seeds. Nothing will sprout from the seed halves that lack an embryo (there must be stored food from the cotyledons and an embryo for the plant to grow).
6. As students are tracking the growth of the seeds, allow them time to type their scientific journals in a word processing program.

E. Presenting the Findings

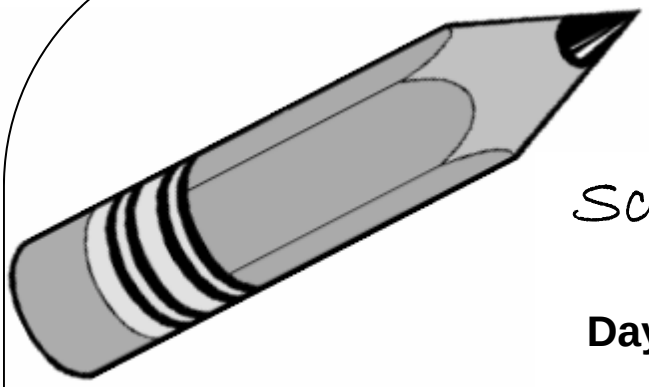
1. Using the digital pictures and typed information from the student’s electronic science journal, have students (either individually or in groups) create a slide show using presentation software.
2. Students will present their slide show to the class.

Questions for Review

Basic Concepts and Processes

After the experiment is complete, have students discuss the observations they recorded. Ask students questions such as:

- What changes occurred in the whole seeds? What changes occurred in the seed halves?
- What did you learn about seeds and plants that you did not know before?
- How did keeping a journal help you keep track of the data?
- Why are accurate drawings, pictures and observations so important in a science journal?



Name: _____

Science Journal

Day # _____

Drawing of the seed we opened today

Observations: _____

_____

_____

_____

_____

_____

_____

_____

_____

Drawing of the Half Seeds (Bag #1)

Drawing of the Whole Seeds (Bag #2)

Science Journal

Teacher Directions

Create a science journal for each student by photocopying this BLM *Science Journal* and stapling eight copies together for each student.

During each observation period, encourage students to make accurate drawings to help them draw conclusions at the end of the experiment. Encourage students to label the three parts of the seed each time they observe. Have students include observations of length when the seeds start to sprout.

Help students understand that the drawings and observations in this journal should be understood weeks and even months later.

Answer Key

Responses will vary.